DEPARTMENT OF THE ARMY
Newport Chemical Depot
Newport Chemical Agent Disposal Facility
Newport Resident Office, Government South Complex
P.O.Box 519, 10th & AA Streets
Newport, IN 47966

May 2, 2003

OM03-0023

Ms. Donna G. Winchester, Manager
Division of Environmental Management
City of Dayton Department of Water
320 W. Monument Ave.
Dayton, OH 45402

SUBJECT: **Hydrolysate Disposal – PermaFix of Dayton**

Dear Ms. Winchester:

Reference is made to your letter dated March 27, 2003 same subject as above.

Thank you for your letter requesting information about the Newport Chemical Agent Disposal Facility. I have enclosed my technical experts' answers to your questions about the neutralization process, the hydrolysate byproduct and the plan to ship it to PermaFix of Dayton.

If you have further questions, please contact Ms. Terry Arthur at (765) 245-4475.

Sincerely,

Jeffrey L. Brubaker
Site Project Manager

Enclosure

Copies Furnished:
COE (Harold Merschman)
PMATA (Kevin Fritz)
JMC (John Kaddatz)

1a. What scientific method will be used to achieve the 20 ppb detection for VX in the hydrolysate prior to release from Newport?

Answer: The Newport Chemical Agent Disposal Facility (NECDF) will use extraction followed by modern chromatographic methods of separation and tandem mass spectrometry (MS-MS) for detection. The method was specifically developed for the analysis of VX in caustic hydrolysate. The Indiana Department of Environmental Management (IDEM) and the Organization for the Prohibition of Chemical Weapons (OPCW) will perform independent oversight of the analyses.

1b. What is the reliability of the method?

Answer: Based on reliability defined as precision and accuracy, the method is completely reliable based upon quality control measures that are done as part of the method. Specifically:

- All samples analyzed in a given batch will be analyzed with two VX spiked samples [called matrix spike and matrix spike duplicate]. These will provide both precision and recovery information on every analytical batch.
- Laboratory blanks and controlled samples will be analyzed provide information on the accuracy of the analyses

2a. What are the physical properties of the hydrolysate that will be transported from Newport to Perma-Fix in Dayton?

Answer: The primary physical properties of the hydrolysate are that it is corrosive with a pH of 13.5 to 14 (due to the presence of sodium hydroxide) and the upper organic layer (3 to 5 % by volume) has a flashpoint of 127 degrees Fahrenheit (slightly flammable).

2b. What is the chemical composition (all known constituents by % weight) of the hydrolysate that will be transported from Newport to Perma-Fix of Dayton?

Answer:

Water	50-60wt%
Sodium 2-(diisopropylamino)ethylthiolate	15-25wt%
Sodium Ethylmethyl phosphonate	14-22wt%
Sodium Hydroxide	0-5wt%
Sodium Methyl Phosphonate	1-3wt%
2-(diisopropylamino)ethyl disulfide	0-5wt%
Diisopropylcarbodiimide	<0.25wt%
Dicyclohexycarbodiimide	<0.25wt%
Ethanol	<0.25wt%
Diisopropylamine	<0.25wt%
1,3 Diisopropylurea	<0.25wt%
1,3 Dicyclohexylurea	<0.25wt%
Sodium Ethylmethylphosphonothioate	<0.1wt%
2-(diisopropylaminoethyl) sulfide	<0.1wt%

Sodium S-(2-diisopropylaminoethly)methyl phosphonothioate <0.0020wt%
O-ethyl-S-(2-isopropylaminoethyl) methylphophonothiolate Non-Detect*

* VX will be non-detect at a Method Detection Limit (MDL) of less than 20 ppb.

2c. What, if any changes are expected in the chemical composition of the hydrolysate during transportation?

Answer: The Army expects no significant changes to occur during transportation. The following minor changes may occur. The oily-like upper layer may increase slightly during transportation because the oily layer will separate from a well mixed hydrolysate. Because hydrolysate consists of a caustic aqueous phase and a small organic phase comprised primarily of stabilizers and ureas (hydrolysis products of the stabilizers), phase separation will occur to form an upper organic layer, the extent of which is dependent upon the mixing that takes place in the tanker truck. The sodium 2-diisopropylaminoethanethiolate (thiolamine) in the hydrolysate may be partially oxidized by oxygen to the corresponding disulfide during transport. The contribution of this insoluble disulfide to the final volume and composition of the organic phase is expected to be minimal because the proposed tanker trucks are vacuum-sealed. While thiolamine will be mostly present in the caustic aqueous phase as its dissociated form, sodium thiolate, the volume of the organic phase will determine the extent to which the undissociated form of thiolamine will partition into it.

2d. What is the chemical composition of the hydrolysate when the pH has been lowered below 11?

Answer: Upon acidification to pH below 11, the following changes would be expected:

- Below pH of 10, the amine groups of thiolamines and other minor amino constituents (e.g., stabilizer breakdown products, thiolamine, and diisopropylamine) will be protonated ($pK_a \sim 10$). This will tend to partially solubilize disulfides, and increase the solubility of the other constituents.
- Below pH of 8, thiolamines in the aqueous phase are fully protonated. The disulfide will be more soluble, although it will continue to exist in the organic phase.
- Below pH of 6, the hydrolysate will consist of a single phase. Residual stabilizers will become unstable and be hydrolyzed to their corresponding ureas.

Below pH of 5, ethylmethly phosphonate, methly phosphonate, and S-(2-diisopropylaminoethly)methyl phosphonothioate will gradually become protonated. The hydrolysis of ethylmethly phosphonate to methly phosphonate and ethanol is possible, although it is not expected in the absence of heat.

Under normal operating conditions, the pH of the hydrolysate will not drop below 13 prior to chemical oxidation. The chemical oxidation and precipitation is expected to completely (or nearly completely) remove all of the degradation products mentioned above. The pH of the treated hydrolysate will not drop below 9 prior to biological oxidation.

2e. What is the scientific method used to analyze the hydrolysate for its constituents?

Answer: The NECDF will analyze hydrolysate for VX and the sodium S-(2-diisopropylaminoethly)methyl phosphonothioate throughout operations. During controlled start-up, the NECDF will also analyze for sodium ethylmethylphosphonate, sodium methyl phosphonate, and Thiolamine. The methods to be used for each analysis are:

- VX: The NECDF will draw a representative sample and transport it to the on-site laboratory. The sample will be extracted and injected into a gas chromatography (GC) tandem mass spectrometer (MS-MS), capable of detecting VX in the parts per billion (ppb) range.
- Sodium S-(2-diisopropylaminoethly)methyl phosphonothioate: A representative sample will be analyzed on-site using High-Performance Liquid Chromatography (HPLC) Tandem Mass Spectrometry (MS-MS), capable of detecting EA 2192 in the low part per million (ppm) range
- Thiolamine: Gas Chromatography (GC) Mass Spectrometry (MS).
- Sodium ethylmethylphosphonate and sodium methylphosphonate: Ion chromatography (IC)

Prior analyses of hydrolysate constituents were conducted using both Phosphorus (P^{31}) and Carbon (C^{13}) Fourier Transform (FT) – Nuclear Magnetic Resonance (NMR).

3a. What analysis resulted in the decision to transport the hydrolysate from Newport, Indiana, to PermaFix in Dayton?

Answer: The Army began looking at alternatives to the on-site Supercritical Water Oxidation (SCWO) Unit in 2001 when reliability and availability issues were raised during the 1/10th scale testing of the SCWO. It was estimated that the Army required significantly more time to work out the developmental and scale-up issues with the SCWO. The Army began looking at off-site shipment as an alternative primarily because the hydrolysate was similar in characteristics to waste already being treated at commercial off-site disposal facilities. It is also important to note that the SCWO does not eliminate the need for an off-site disposal facility. The SCWO effluent would still require off-site disposal. The SCWO effluent would be less hazardous than the hydrolysate, but would have more than six times the volume of the hydrolysate, possibly adding a greater transportation risk.

Following the events of Sept. 11, the Army immediately began evaluating methods to reduce public risk associated with chemical stockpile storage. The Army determined that using existing off-site commercial facilities that are licensed and permitted to treat hazardous wastes for post-treatment best supports the Army's mission to reduce public risk associated with chemical stockpile storage. The key element of this is ensuring the safe disposal of hydrolysate.

Parsons (as the NECDF Systems Contractor) had responsibility for selecting this subcontractor in accordance with Parsons procurement procedures and within the procurement guidelines of the contract with the U.S. Army. These procurement procedures include very extensive requirements to insure that the subcontractor selection process is objective and unbiased, and resulted in the selection of the best-qualified subcontractor for the work being performed. Some of the specific criteria used throughout the procurement of TSDF(s) included safety record, environmental compliance record, treatment capabilities of equipment and facility, technical expertise of facility

and corporate personnel, transportation safety record and plan for the safe transportation of the hydrolysate, adequate insurance coverage, having the appropriate environmental permits, financially viable and responsible, and possession of the outreach capabilities with a specific outreach plan for the hydrolysate project. The process was long due to the complexity of the selection, and the inclusion of the following steps:

- Thorough Nationwide Review of TSDF Capabilities -
- Selection of TSDFs From which Proposals Would Be Requested
- Selection of Subcontract TSDF

3b. What alternatives were considered?

Answer: Originally, the Army's plans were to neutralize the VX with sodium hydroxide and then to further treat the hydrolysate by Super Critical Water Oxidation SCWO. While destruction of the hydrolysate to SCWO effluent met analytical requirements, the availability of the SCWO system during tests in 2000-2001 timeframe were low enough for the Army to consider alternatives. Prior to the terrorist attacks of 9/11/01, the Army was considering off-site disposal of the hydrolysate at a commercial facility, or the development of an alternative on-site treatment. After the terrorist attacks, the Army moved in a parallel path of developing SCWO and developing other off-site disposal alternatives (incineration, deep well injection, and biological wastewater treatment) in order to expeditiously eliminate the nerve agent stockpile. It's important to note that accelerating the schedule in destruction of the agent was the significant factor in the decision not to use SCWO at Newport.

3c. Was there a relative-risk assessment of the alternatives?

Answer: Yes. The risk assessment was a comparison of the risks of continued storage and the associated potential for terrorist activities versus the risk associated with disposal of the hydrolysate in an offsite permitted treatment, storage and disposal facility (TSDF) that could accept and treat/dispose of the waste.
[Reference: Environmental Assessment for the Accelerated Neutralization of Chemical Agent and Off-site Shipment of Liquid Process Effluents at the Newport Chemical Agent Disposal Facility (July 2002) and the resulting Finding of No Significant Impact (Oct 2002)]

3d. Was there an analysis of the costs of the alternatives?

Answer: Yes. However, safety is the primary concern. The Army is attempting to expeditiously eliminate a potential terrorist target (the nerve agent stockpile) without sacrificing the safety of the workforce, the safety of the public, or protection of the environment. Again this analysis compared the costs of continued SCWO development versus the costs for off-site disposal of the hydrolysate in a TSDF

3e. If analyzed, was the potential cost associated with a transportation accident and response included?

Answer: These costs were not included within the cost analysis.
Although upset conditions were not quantitatively addressed, an accident involving hydrolysate will be less hazardous and much easier to remediate than an accident involving nerve agent.

4a. What is the environmental fate (soil, water and air--fate and persistence) of the constituents of the hydrolysate if accidentally released?

Answer: An article in Enviornmental Heath Perspectives (Volume 107, Number 12, December 1999), entitled, *The Sources, Fate, and Toxicity of Chemical Warfare Agent Degradation Products*, partially addresses this issue. In the abstract, this article states:

1) Major VX degradation products estimated to be of significant persistence (weeks to years) include ethyl methyl phosphonate, methyl phosphonate, and possibly S-(2-diisopropylaminoethyl) methyl phosphonothioate ; and
2) Of all of these compounds only S-(2-diisopropylaminoethly)methyl phosphonothioate possesses high mammalian toxicity [Note this toxicity is only through ingestion because it is not absorbed through the skin.] This compound is not present in significant quantities to pose a risk in a spill scenario (trace amounts possible in the hydrolysate in the low part per million range).

Air

In this same article the volatility of these compounds are reported as very low with ethyl methyl phosphonate at 3.6×10^{-4} mmHg, methyl phosphonate at 2×10^{-6} mmHg, and the volatility of the S-(2-diisopropylaminoethly)methyl phosphonothioate is reported as non-detectable (ND). Thus, the air transport for any of these major degradation products is considered essentially non-existent. Thiolamine, the final major constituent in hydrolysate, exists primarily in its non-volatile salt form. As a result, its air transport is also considered non-existent.

Soils

Ethyl methyl phosphonate has been found to disappear fairly rapidly from soils; however, it is likely that it degrades to methyl phosponate, which is more stable in the environment. Both methyl phosphonate and S-(2-diisopropylaminoethly)methyl phosphonothioate have been predicted to be highly mobile because they are not easily sorbed to soils and are highly soluble in water. Thiolamine would tend to sorb to the natural organic matter in the soil and be biodegraded by the fungi and bacteria present in the soil.

Water

All of these degradation products are believed to be mobile in water due to their high solubilities.

Bioaccumulation

None of the compounds are expected to bioaccumulate.

Based upon this environmental fate and transport information, the following scenario would be expected during a spill of hydrolysate. The first response effort will contain and capture free liquids. Those liquids not captured will move into exposed soils. This soil will be removed to a disposal site immediately after all free liquid is removed.. The losses to the groundwater of such a spill would be expected to be minimal. The losses to the atmosphere will also be minimal based upon vapor pressures of the primary constituents of the hydrolysate even though the thiols are odiferous and are described as having a “skunky” odor. Between the liquid and soil removed

virtually all of the constituents will be removed and disposed of at a TSDF (e.g., PermaFix or a closer TSDF selected by Parsons).

4b. Is there a detailed emergency response plan and training in place for HazMat responders in the event of a release in transit or on-site at PermaFix of Dayton?

Answer: Perma-Fix of Dayton, Inc. has a detailed on-site response plan for emergencies that may occur at the facility. The local responders are familiar with this site and have toured the facility. The company is working with first responders in Jefferson Township to provide them with information about the chemical makeup and transportation of the hydrolysate and to ensure that they have the proper training and equipment in the event of a release.

In early summer 2003, detailed meetings will be held with first responders along the transportation route to also provide them with information about the Hydrolysate and to give them an opportunity to examine one of the trucks that will be used to transport the materials. A detailed emergency response plan and training information for responding to a potential Hydrolysate spill will be completed by the end of August 2003.

4c. What long-term remedial actions might be necessary in the event of a hydrolysate release?

Answer: It is not anticipated that there would be any long-term remedial actions in the event of a Hydrolysate release. In the event of a release, control and containment activities would be implemented to minimize the extent of impact. Remedial action would include removal of all contained liquids and impacted soil for proper disposal. Confirmation sampling and analysis would be conducted to ensure complete remediation of the impacted area. Remedial action would be conducted in accordance with standard caustic spill remediation practices and the completeness of any necessary cleanup would be verified by the Ohio Environmental Protection Agency.

5. Is there any continuous monitoring or are there any en-route checks planned for the hydrolysate during transport?

Answer: The trucks that will be used to transport Hydrolysate from Newport, IN to Perma-Fix of Dayton will be vacuum tankers, specially purchased for the project. These vehicles allow for a vacuum to be maintained on the loaded tanker during transport. Maintaining a vacuum on the tanker will eliminate the possibility of vapors escaping from the tankers.
The level of vacuum of the tanker will be monitored by the driver through the use of a remote gauge located in the cab of the truck. In the event of a vacuum drop, the driver will have the ability to stop the vehicle and physically operate the system to maintain a constant vacuum on the tanker. All drivers have mobile communication systems that allow for immediately contacting the dispatch office for assistance.

Each of the tanker trucks to be used for Hydrolysate transport will also be equipped with a global positioning system (GPS) that will allow for monitoring the location of the tanker trucks from the time they leave the Newport facility until they arrive at the Dayton facility.

The drivers of the trucks will be dedicated to this project and will have additional training on the transportation of the hydrolysate. All drivers are specially licensed to haul hazardous materials. The trucks will follow a designated, hazardous carrier route and will, of course, stop for inspection at all monitoring stations established by the States of Indiana and Ohio.

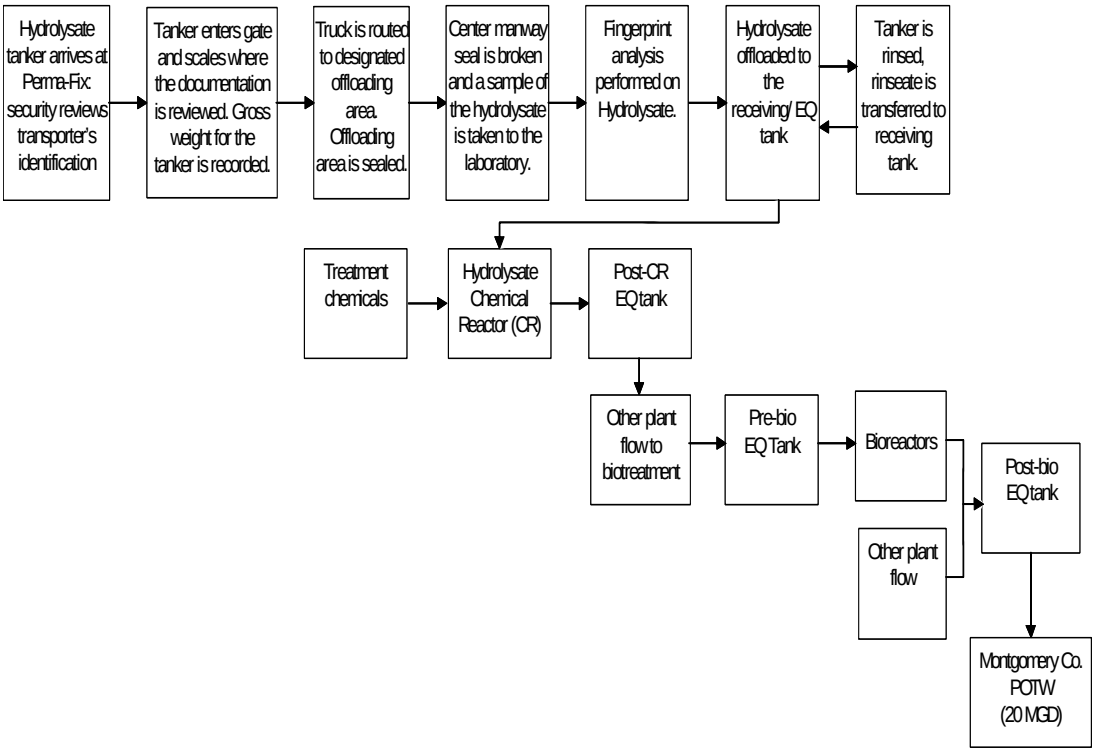
6. Please provide a detailed flow diagram of the steps to be taken once the material reaches Perma-Fix?

Answer: The required steps that will be taken once the material reaches Perma-Fix are listed below:

1) Truck arrives at gate
2) Security reviews transporter's identification
3) Truck enters gate and scales where the seals will be inspected
4) Documentation for the truck is reviewed. If correct, the gross truck weight is recorded
5) Truck is routed to designated offloading area. The offloading area is sealed after the truck is safely in.
6) Video/closed circuit cameras capture intact security seals
7) Seal is broken on center manway of the tanker and a sample is taken from the tanker and carried to the laboratory. The manway is then closed.
8) A fingerprint analysis is performed by the laboratory to confirm the waste received conforms with the waste profile (pH, flashpoint, density, physical appearance)
9) If fingerprint analysis results indicate waste conformance, offloading hoses are connected to the tanker truck and receiving pipe.
10) The tanker is offloaded to the receiving tank
11) When emptied, the tanker is rinsed and the rinsate is also transferred to the receiving tank.
12) After rinsing, the truck is routed to the exit gate
13) Signed documents are given to the driver
14) Driver leaves the facility
15) Waste is processed. Refer to flow diagram below.

(*See diagram that follows)*

Perma-Fix biological treatment process of hydrolysate



7a. What type of biological treatment is proposed for the hydrolysate?

Answer: The biological treatment system that will be used to treat the hydrolysate is the Sequencing Batch Reactor (SBR), which is a hold, test, and release suspended growth activated sludge biological treatment system. This system has been operational at the Perma-Fix of Dayton facility since late 2000.

7b. How will the pH of the hydrolysate be adjusted to optimize the biological treatment?

Answer: The pH of the hydrolysate will be adjusted to optimize the biological treatment through the use of standard water treatment materials such as acid and alkaline materials (e.g., lime and sodium hydroxide). Using these materials as necessary will allow the pH be optimal for biological treatment.

7c. What solid, liquid, and gaseous products will result from the biological treatment?

Answer: Solids generated during biological treatment process consist of biomass (microorganisms) formed during the process. Liquids generated by the biological treatment process consist of water with minor concentrations of iron and other metals and salts (minor hydroxides, chlorides, sulfates, etc). All discharges will be in accordance with the Perma-Fix of Dayton wastewater permit issued by Montgomery County. Gas generated by the biological treatment process is primarily carbon dioxide (CO_2).

7d. How will the treatment products be managed?

Answer: The only treatment product that will have to be managed independent of Perma-Fix's existing discharge permits are the solids containing microorganisms. These will be disposed of at a permitted Subtitle D landfill in accordance with all USEPA and State of Ohio regulations and any applicable Land Disposal restrictions.

8a. Are there any constituents of the hydrolysate, or do any of the treatment products warrant air monitoring for occupational or off-site exposure?

Answer: Yes, the volatile organic compounds (VOCs) of the upper layer of the hydrolysate will require monitoring for exposure to workers in enclosed spaces. This is an occupational exposure issue associated with chronic, long-term exposures to this compound that should not be an issue outside of the TSDF by ventilation and contaminant removal.

The on-site processing controls (ventilation controls of unloading and treatment units with treatment of the emissions by a regenerative thermal oxidizer) are such that off-site monitoring would not be required. The likelihood of a major spill is small. However, should a major spill occur, Hazardous Waste Operations and Emergency Response activities will be in place to contain the spill in a timely fashion. Off site air monitoring during such an incident is not required nor planned.

As is common practice in responding to caustic spills, the MSDS-requires self-contained breathing apparatus (SCBA) to be worn by Emergency Responders to protect them from vaporized caustic and other VOCs.

8b. If so, what are the air-monitoring provisions for off-loading and treatment at PermaFix of Dayton?

Answer: Air-monitoring systems will be installed and operated in processing areas as needed to alert Perma-Fix personnel in the event workplace emission levels exceed threshold limits. Along with any workplace air-monitoring systems required, the process of off-loading and treatment of the hydrolysate will occur in a closed-loop, ventilation controlled system. Environmental

controls in place include negative pressure atmospheres in the hydrolysate processing area with all exit air passing through a regenerative thermal oxidizer

Once the Hydrolysate arrives at the Perma-Fix facility, it will be processed in closed tanks and will not be exposed to the environment during any stage in the process at Perma-Fix.

8c. Is there an evacuation plan for neighboring residents?

Answer: An evacuation plan is not necessary for this material. The MSDS classifies hydrolysate as a Class 8 (Corrosive) with a subsidiary Class 3 (Flammable). Emergency Response for this categorization requires the establishment of a 50 – 100 meter containment area around the spill. Other than existing evacuation plans, which may have been developed by the Local Emergency Planning Agencies, no special evacuation plans are needed.

8d. Will there be special training and equipment for responders to use for fugitive emissions or accidental releases of vapors?

Answer: Fugitive emissions, (i.e., vapors emitted during normal operating conditions) and accidental release of vapors (i.e., releases resulting from abnormal operating conditions) will be limited during transportation by the use of vacuum-sealed tanker trucks (with continuous monitoring by the driver). All efforts will be taken to prevent spills along the transportation route. At the Dayton Facility a negative-pressure unloading area vented directly to the Regenerative Thermal Oxidation (RTO) unit will limit fugitive emissions and contain accidental releases associated with spills.

As a component to the Public Outreach program, Perma-Fix will meet with First Responders in Jefferson Township and along the entire transportation route. The goal of these meetings is to provide information and training, if necessary, for responders who may be required to respond to an accidental release. Perma-Fix will provide First Responders will be provided with information about chemical constituents of hydrolysate, recommended protection and handling information, emergency contact numbers and information about the vacuum tankers that will be used to transport the hydrolysate. The first responders are already prepared to respond to much more dangerous materials than the hydrolysate (primarily a corrosive hazard).

9a. There are indications that the hydrolysate or its treatment may result in odors. What chemicals are the sources of the odor?

Answer: Odors related to hydrolysate are largely associated with the thiolamine (skunky odor) and to a lesser extent from the ureas (breakdown products from the stabilizers) and other amino-based impurities. The thiolamine is a mercaptan, similar to the mercaptans used to give odor to natural gas (in order to detect leaks). The Perma-Fix pretreatment process and the regenerative thermal oxidizer will minimize, if not eliminate, odors.

9b. How will odor control be accomplished?

Answer: Odor control is accomplished by transporting the hydrolysate only in tanker trucks that are maintained under a vacuum (to preclude release of any vapors outside the tanker). After the

tanker reaches the facility, it is moved into an enclosure for unloading, it will be pumped into tankage inside a ventilated bay. This ventilated bay is maintained under negative air pressure with the air removed from this enclosure and sent to a regenerative thermal oxidizer (RTO) for treatment of any chemicals in the airstream.

The pre-treatment of hydrolysate, which will occur in Perma-Fix's closed-loop system, has been shown to eliminate the odors associated with Hydrolysate. The closed-loop treatment process, combined with Perma-Fix's Regenerative Thermal Oxidizer (RTO) is designed to eliminate any potential for odors being emitted from the process.

9c. What monitoring equipment will enable the community responders to know if the odors are toxic?

Answer: The DoT hydrolysate classification of hydrolysate [Class 8 (Corrosive) with a subsidiary Class 3 (Flammable)] requires that Emergency Responders (2000 Emergency Response Guide 132):

1. Establish a 50 to 100 meter containment area around the spill, and
2. Wear self-contained breathing apparatus (SCBA).

This DoT classification does not required evacuation of surrounding areas. However, in their capacity for safeguarding and providing assurances for the surrounding communities, it is important to recognize that human detection of hydrolysate constituents will occur at levels below those determined to pose potential health hazards (i.e., people will smell it at extremely low concentrations at levels that are not dangerous). An NECDF hazard analysis and modeling of a credible event does not indicate levels that would pose an acute or chronic health risk to the public or to the community responders.

10a. What are the physical and chemical characteristics of the material to be discharged to the sanitary sewer system?

Answer: Greater than 99% of the organic compounds found in hydrolysate will be removed through physical separations, chemical oxidation, and biological destruction during the Perma-Fix treatment process. Under no circumstances will Perma-Fix discharge water to the sanitary sewer system that is outside the limitations of the discharge permit. The material to be discharged is wastewater that meets the Discharge Limitations and Self Monitoring Requirements of the Perma-Fix discharge permit. This water will contain constituents at levels very similar in physical and chemical properties to those of current effluents at Perma-Fix. The pH of the discharge will be between 6.0 and 11.5.

Hydrolysate contains minor concentrations of metals that are regulated under EPA regulations and the Perma-Fix discharge permit. The concentrations of metals will not exceed discharge permit levels. Iron will be used in the treatment process, and it can be anticipated that some iron will remain in the effluent.

10b. Is there any potential for the discharge to be incompatible with other waste discharged to the sanitary sewer system?

Answer: No, since the Perma-Fix effluent will be consistent with current effluent characteristics, it will be compatible with other discharges. Perma-fix cannot address the consistency and permit compliance of discharge streams from other sources, which may be sent to the Western Regional Wastewater Treatment facility

10c. If so, what emergency response actions are planned to deal with these reaction products (unusual odors, etc.) in the event reaction products escape into other dwellings or structures connected to the same sewer system?

Answer: As discussed in the previous response, Perma-Fix believes that there is no potential for the discharge to be incompatible with other waste discharged to the sanitary sewer system. Perma-Fix has no knowledge of the makeup of wastes discharged to the sewer system from other sources regulated by Montgomery County.

10d. Will the discharged material have an impact on the chemical makeup of the sludge generated at the publicly owned treatment works?

Answer: The chemical makeup of the sludge generated at the POTW is based on the organics in the wastewater being treated. Since greater than 99% of the organics in the hydrolysate will be removed prior to entering the POTW, the chemical makeup of the sludge at the POTW will not be adversely impacted. The organic loading in the POTW raw wastewater should be the same with or without the treated hydrolysate discharge.

10e. If so, how will the sludge be changed?

Answer: As described in Item 10d above, the sludge will not be changed.